

# THE VARIETIES OF SILPHIUM INTEGRIFOLIUM

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The genus *Silphium* (Compositae) was described first by Linnaeus in 1753 in *Species Plantarum* which listed five species. Small (1933) recognized more than thirty species of *Silphium*. Perry (1937), who has written the only extensive taxonomic treatment of the genus, recognized 23 species and several varieties. T. R. Fisher and some of his students currently recognize 16 species.

All of the species of *Silphium* which have been studied are diploid ( $2n=14$ ) (Figure 2). The plants reproduce sexually by outcrossing; selfing rarely occurs. Vegetative reproduction occurs from the perennial rhizomes. Apomixis has not been reported for the genus. Flowering occurs from June to September.

The genus occurs only in North America north of Mexico, ranging from Florida to Connecticut, northwest to the Dakotas, and southwest to Texas. *Silphium* is in the tribe Heliantheae which is characterized by radiate heads, herbaceous phyllaries, chaffy receptacles, and blunt anthers.

Small (1933) divided the genus into five sections on the basis of phyllary pubescence, grouping of inflorescences, and leaf position. Section I, *Perfoliata*, contained the species with perfoliate leaves; sections II and III, *Laciniata* and *Composita* respectively, contained the species with mostly basal leaves; sections IV and V, *Dentata* and *Integrifolia* respectively, contained the species with leafy stems. *Silphium integrifolium* is included in the section *Integrifolia*.

As a part of a more extensive study of *S. integrifolium*, field collections and herbarium material from FSU, GA, GH, MO, ND, NY, PH, TENN, WIS, WVA, and US were studied. See Lanjouw and Stafleu (1964) for abbreviations.

## TAXONOMY

***Silphium integrifolium*** Michx. Fl. Bor. Am. 2: 146. 1803.  
(Holotype: Hab. in regione Illinoensi. A. Michaux, P).

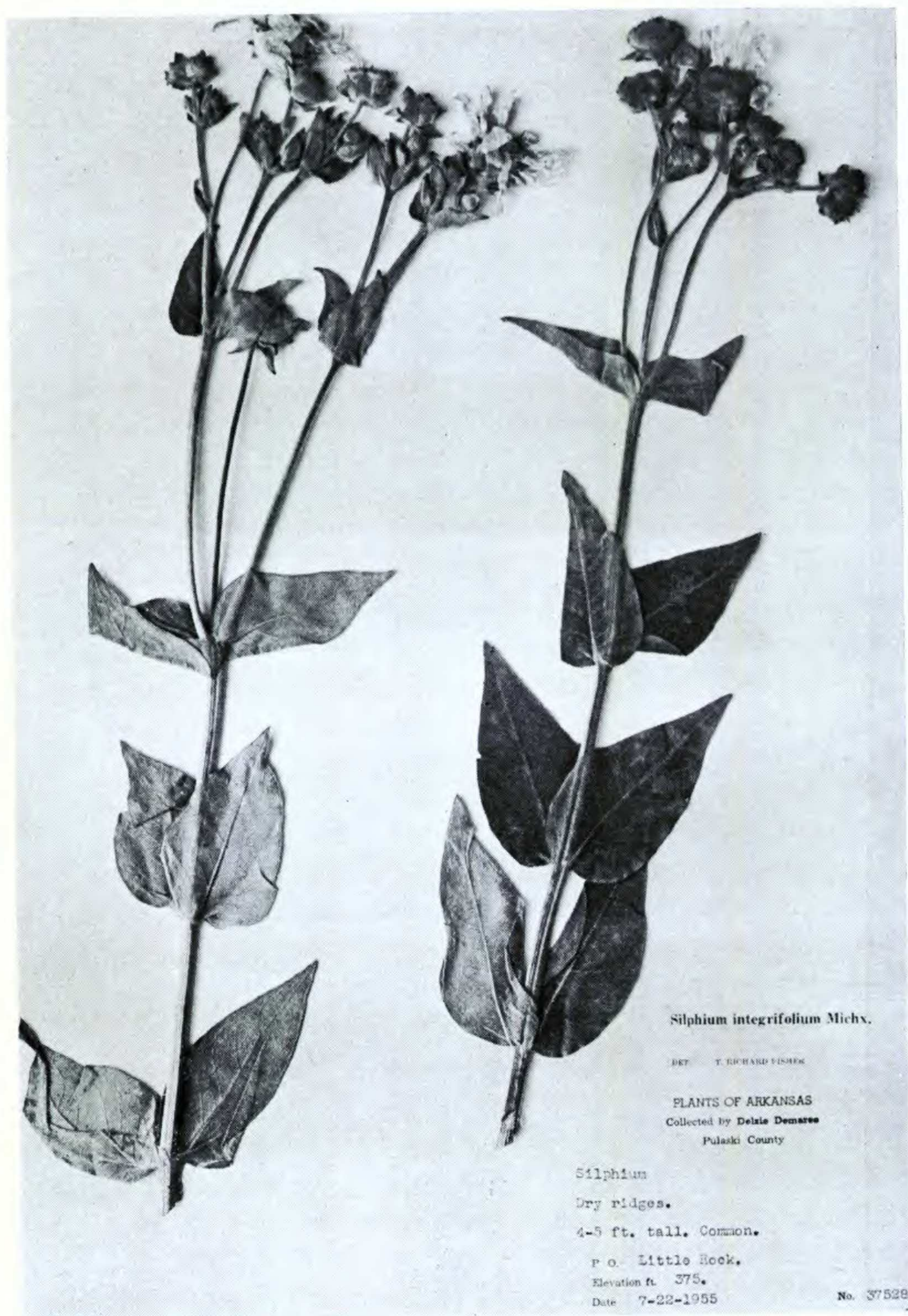


Figure 1. Photograph of *Silphium integrifolium* specimen. (Photograph by Wm. Anderson)



Figure 2. Mitotic cell from root tip of *Silphium integrifolium*,  $2n=14$ , Fisher 624. 1125  $\times$ .

*Silphium laevigatum* Pursh, F. Am. Sept. 2: 578. 1814.  
 (Lectotype: In Georgia, Fl. Am. Bor. A. *Enslen*, w!).  
 Perennial, with short, thickened, sometimes creeping rhizome; stems to 1.5 m tall, pilose, scabrous, or almost glabrous; leaves lanceolate to elliptic, sessile, usually opposite, toothed or entire, upper surface scabrous, lower pilose, scabrous, or glabrous; heads several in close corymb; peduncles short, much branched, with or without glandular-pubescence; phyllaries lance-ovate to elliptic, imbricate, pilose, hispid, or rarely glabrous, with or without glandular-

pubescence; achenes obovate or orbicular-obovate, winged, toothed.

Pursh's description of *S. laevigatum* was based on plants collected by Aloysius Enslen in western Georgia. Pursh's description and the type specimen are very similar to *S. integrifolium*. If the specimen was collected in western Georgia, it was not within the present known range of *S. integrifolium*. Because the present range extends eastward to central Alabama, a few plants might have grown in western Georgia at an earlier time, or even at the present time, escaping collection for some reason. The possibility also exists that the information on Enslen's label is incorrect.

*Silphium integrifolium* is a rather homogeneous group of plants, morphologically. However, the most obvious and consistent differences are the kind and extent of vesture (vestiture) on the phyllaries and on the lower surface of the leaves.

#### KEY TO VARIETIES

- A. Lower surface of leaves and phyllaries glabrous ..... 2. var. *gattingeri*
- A. Lower surface of leaves and/or phyllaries pubescent ... B
- B. Lower surface of leaves pilose (velvety) ..... 3. var. *deamii*
- B. Lower surface of leaves hirsute, pubescent, or glabrous ..... C
- C. Phyllaries glandular-pubescent ..... 4. var. *neglectum*
- C. Phyllaries not glandular-pubescent ..... 1. var. *integrifolium*

1. *Silphium integrifolium* Michx. var. *integrifolium*.

Although Perry (1937) mentioned "typical *S. integrifolium*," she naturally, at that time, did not refer to these plants as belonging to variety *integrifolium*. Cronquist (1945) called this group *S. integrifolium* var. *integrifolium*. C. A. Weatherby (1935, written communication to C. C.

Deam) examined the type sheet of *S. integrifolium* and found that the involucre are pustulate-scabrous or strigose, but not glandular.

2. *Silphium integrifolium* Michx. var. *gattingeri* Perry, *Rhodora* 39: 287, 288. 1937. (Holotype: Tennessee: Charlotte Pike, Nashville, July 1886, *Gattinger* GH!).

This variety has been found only in Davidson County, Tennessee.

3. *Silphium integrifolium* Michx. var. *deamii* Perry, *Rhodora* 39: 287. 1937. (Holotype: Indiana: Vermillion County, right of way of the railroad 1 mile east of Dana. *C. C. Deam* 54376 GH!).

Perry (1937) placed all of the plants of *S. integrifolium* having glandular-pubescent phyllaries into this variety.

4. *Silphium integrifolium* Michx. var. **neglectum** Settle and Fisher *var. nov.* (Holotype: Indiana: White County. *T. R. Fisher* 73, Bowling Green State University Herbarium!).

Phyllaria cum pilis glandulosis. Pagina inferior folii glabra vel pubescens sed non pilosa.

The plants of this variety have glandular-pubescent phyllaries and leaves with hirsute, pubescent, or glabrous, but not pilose, lower surface.

#### GEOGRAPHIC DISTRIBUTION

The general distribution of *Silphium integrifolium* is approximately the same as that of the tall grass prairie of the United States. The range of *S. integrifolium* extends into eastern Indiana, west into Kansas, southwest into Texas, southeast into Alabama, and north into Wisconsin. Distribution of the varieties, compiled from field collections and from herbarium specimens, is shown in Figure 3.

*Silphium integrifolium* and *S. speciosum* are sympatric in the Kansas-Oklahoma area, and *S. integrifolium* and *S. scaberrimum* are sympatric in the Oklahoma-Texas-Arkansas area. Naturally occurring putative hybrids between *S. integrifolium* and *S. speciosum* and between *S. integrifolium* and *S. scaberrimum* have been found.

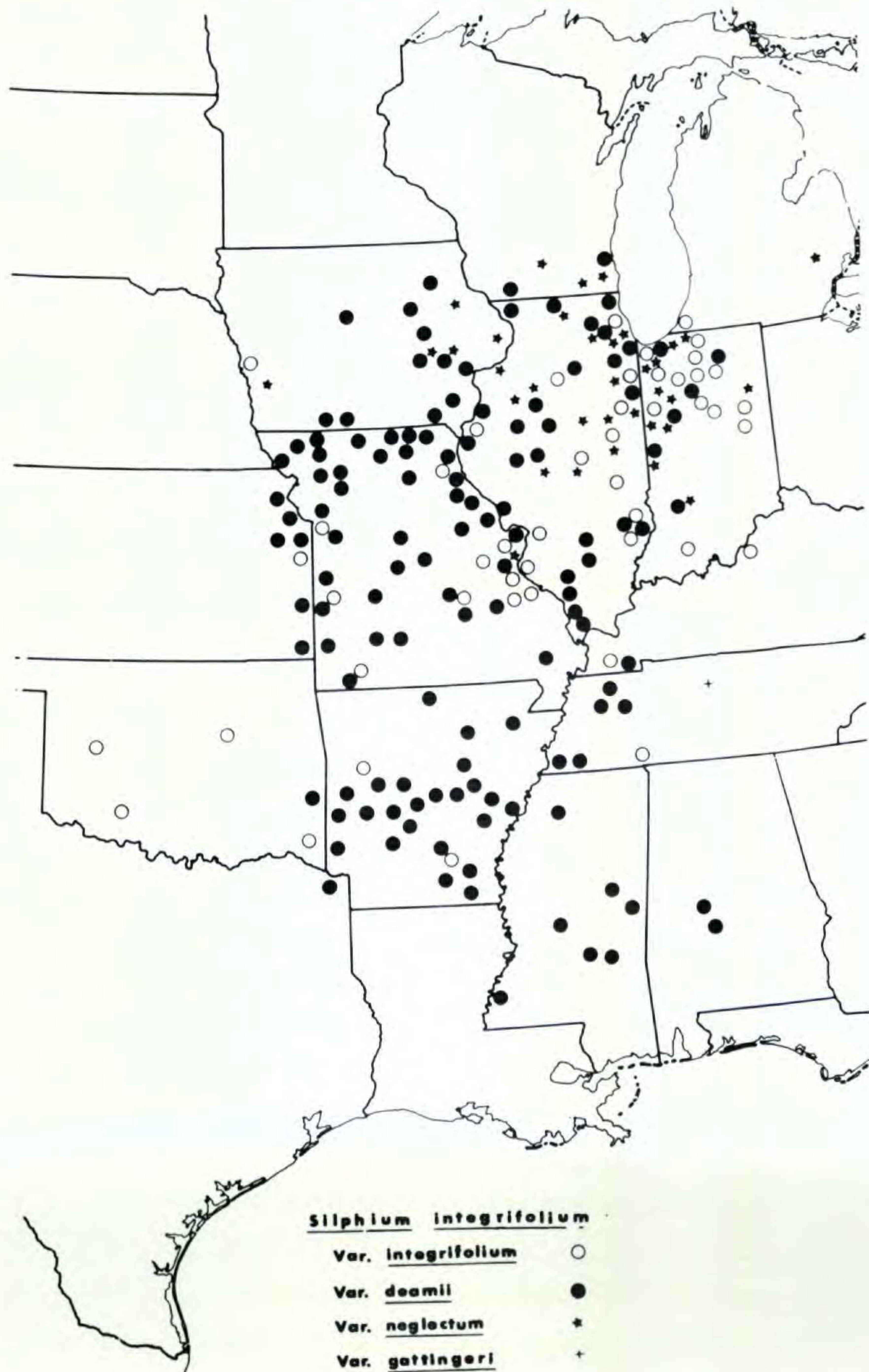


Figure 3. Distribution of *Silphium integrifolium* and its varieties.

The varieties (Figure 3) do not have distinct geographic distributions. The variety *neglectum* does have a restricted distribution, being restricted to the northeastern, glaciated portion of the range of the species. The variety *deamii* appears to be the most widespread geographically and also the most common of the varieties.

#### CONCLUSIONS

Three of the four varieties treated in this paper were recognized in Perry's work published in 1937. However, Perry's delimitation of varieties does not take into account a large portion of the plants which are distinctive because of the pilose pubescence of the lower surface of the leaves. This character is more striking and obvious than the glandular-pubescence of the phyllaries which Perry (1937) used as the principal basis for recognizing varieties.

The vesture of the abaxial surface of the leaves, in addition to the vesture of the phyllaries, seems to be a more satisfactory character upon which to base the varieties. Although *S. integrifolium* is a rather homogeneous group of plants, differences do exist which should be recognized. These differences are sufficient to merit recognition as separate varieties but not great enough to warrant separating the species into subspecies. Therefore, *S. integrifolium* should be considered to include four varieties: *S. integrifolium* var. *integrifolium*, *S. integrifolium* var. *deamii* Perry, *S. integrifolium* var. *gattingeri* Perry, and *S. integrifolium* var. *neglectum* Settle and Fisher.

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#### LITERATURE CITED

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A PRIOR RECORD OF *CHRYSANTHEMUM LACUSTRE* BROTERO: In a recent note in this journal (72:250, 1970) I reported *Chrysanthemum lacustre* Brotero, a Portuguese introduction, as being recently discovered for the first time in Gray's Manual range. However, Camille Rousseau, of Université Laval in Quebec, has informed me of a record made twenty years previously in Canada. In *Énumération des plantes du Canada, Naturaliste canadien*, 93:1046 (1966) Bernard Boivin cites a collection from Ottawa, Ontario, deposited in the DAO Herbarium, with label reading "Abandoned fields, 1 mi. west of RR. bridge over Rideau Canal, 1948, G. A. Mulligan."

I am most appreciative of Prof. Rousseau's pointing out this earlier record and supplying me with the details.

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